

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A method for forming a metallic composite structure, comprising:

placing undeformed sheet metal between a die and a platen, said die and said platen configured to sealingly engage a periphery of said sheet metal for forming a die enclosed area of the sheet metal, said die having a forming surface defining a cavity between said forming surface and said metal sheet;

moving said die and platen to their closed position such that said die engages the periphery of said sheet metal at said metal sheet;

adjusting the temperature of said sheet metal to the material blow forming temperature to reduce the density of said metallic composite structure;

applying positive gas pressure to a surface of the sheet metal so as to superplastically form the sheet metal to at least partially conform with said die forming surface; and

coupling metallic foam substrate to the sheet metal.

2. (original) The method according to Claim 1, wherein coupling metallic foam substrate to the sheet metal occurs prior to applying gas pressure to form the sheet metal.

3. (currently amended) The method according to Claim 1, wherein coupling metallic foam substrate to the sheet metal occurs after ~~to~~ applying gas pressure to form the sheet metal.

4. (original) The method according to Claim 3, further comprising applying an adhesive between the metallic foam and the sheet metal.

5. (original) The method according to Claim 1, wherein coupling metallic foam substrate to the sheet metal is deforming the sheet metal to form a pair of interfacial surfaces which couple to a pair of surfaces on the metallic foam.

6. (currently amended) The method according to Claim 1, wherein placing sheet metal between a die and a platen ~~is~~ comprises placing a metal sheet having a depending metallic foam sheet disposed thereon.

7. (currently amended) The method according to Claim 1, wherein placing sheet metal between a die and a platen ~~is~~ comprises placing a metal sandwich structure having a first and second sheet metal layers, and coupling a metallic foam substrate ~~is~~ comprises positioning a metallic foam layer therebetween.

8. (original) The method according to Claim 1 wherein the sheet metal is a superplastically formable alloy.

9. (original) The method according to Claim 1 wherein the metallic foam is a superplastically formable alloy.

10. (original) The method according to Claim 1 further comprising brazing material between the foam and the sheet metal.

11. (original) The method according to Claim 1 wherein the metallic foam is a high purity aluminum alloy reinforced with a low volume fraction of (~1 micron) ceramic particles.

12-18. (cancelled)

19. (new) A method for superplastically forming a composite metallic foam sandwich structure, comprising:

arranging a metallic foam substrate between two opposing undeformed metal alloy sheet layers to form a sandwich structure;

placing said sandwich structure between upper and lower die members configured to sealingly engage at least a periphery of said sandwich structure;

heating said sandwich structure to a suitable superplastic blow forming temperature to reduce the density of said metallic foam;

moving said die members to a closed position configured to form a cavity with an enclosed area of at least one of said metal alloy sheet layers; and

applying positive gas pressure to said at least one metal sheet layer and superplastically blow forming said sandwich structure within said die members.

21. (new) A method according to Claim 19 further comprising applying at least one of an adhesive and brazing material between said metallic foam and said metal alloy sheet layers.

22. (new) A method according to Claim 19 metallic foam comprises a high purity aluminum alloy reinforced with a low volume fraction of (~1 micron) ceramic particles.

23. (new) A method according to Claim 19 further comprising coupling said metallic foam substrate to said metal alloy sheets prior to applying positive gas pressure and superplastically blow forming said sandwich structure.

24. (new) A method according to claim 23 wherein coupling said metallic foam substrate to said metal alloy sheets comprises deforming at least one of said metal alloy sheets to form a pair of interfacial surfaces configured to couple with a pair of surfaces on said metallic foam substrate.